DOCUMENT RESUME

ED 140 973 PS 009 358

AUTHOR Gadberry, Sharon
TITLE Television Viewing and School Grades: A Cross-Lagged Longitudinal Study.
PUB DATE Mar 77
NOTE 14p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (New Orleans, Louisiana, March 17-20, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Academic Achievement; Age Differences; *Elementary Education; Elementary School Students; Middle Class; *Television Research; *Television Viewing

ABSTRACT

This study attempted to determine whether television viewing amount independently affects school performance. The television viewing amount and school grades of 43 male and 47 female middle class subjects from three age groups (6 to 7, 8 to 9, and 10 to 11) were measured twice, 18 months apart. Cross-lagged panels were tested using correlations between viewing amount, academic grades, and effort grades. The amount-effort panel supported the causal hypothesis that increased television viewing caused lower school grades ($z = -2.00$, $p < .05$). The difference between cross-lagged correlations for effort and academic grades of 6 - 7-year-olds and effort grades of low achievers provided strongest support for the prediction. For the latter groups, two specific content categories positively affected academic grades and two content types decreased grades. Effort grades were generally decreased by total viewing irrespective of content dimensions. (Author/SB)

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## Abstract

### Television Viewing and School Grades: A Cross-lagged Longitudinal Study

Television viewing amount and school grades were measured twice, 18 mos. apart, in 90 male (n = 43) and female middle-class subjects from three age groups: 6 - 7 yrs., $n$ = 29; 8 - 9 yrs., $n$ = 31; 10 - 11 yrs., $n$ = 30. Cross-lagged panels were tested using correlations between viewing amount, academic grades, and effort grades. The amount-effort panel supported the causal hypothesis that increased television viewing caused lower school grades ($z = -2.00$, $p < .05$). The difference between cross-lagged correlations for effort and academic grades of 6 - 7 yr. olds and effort grades of low achievers provided strongest support for the prediction. For the latter groups, 2 specific content categories positively affected academic grades and 2 content types decreased grades. Effort grades were generally decreased by total viewing irrespective of content dimensions.


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Presented at the Society for Research in Child Development.
New Orleans, March, 1977.

# Television Viewing and School Grades: A Cross-Lagged Longitudinal Study

Sharon Gadberry

Adelphi University

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School-age children presently view television at a yearly rate nearly equal to the time they spend in formal education. Do the effects of home television-viewing enhance or undermine the efforts of educators? There are several points of view.

Television as a teacher. The results of laboratory and field studies, usually comparing the effects of pro-social, neutral, and aggressive programs, suggest that the effects of television viewing on school grades depend on content. Violent programs may interfere with adaptive task behaviors (Friedrich & Stein, 1973). Educational programs can painlessly expose pre-schoolers, underachievers, and lower-class children to learning experiences they would ordinarily either miss or reject.

Viewing as an activity. Although not presently supported by research results, there is another notion that increased viewing undermines school performance because it displaces problem-solving, interpersonal interactions, and other educational experiences occurring in the home. Viewing as an activity is seen as passive; it encourages interest in fantasy and immediate gratification.

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Television as an effect. Other institutions, primarily the family, directly control the child. Thus the true cause underlying any correlations between television and school performance is family influence. Even in the case where children themselves determine viewing rate and choose programs, the

family indirectly determines viewing by providing previous or ongoing socialization experiences.

The main purpose of the present study was to determine whether television viewing amount independently affects school performance. The cross-lagged longitudinal design, previously used by Eron, Huesman, Lefkowitz, and Walder (1972), to establish the direction of effects in violence viewing and aggression, was adopted as an appropriate method. The roles of age, sex, and intelligence level were also examined by comparing the cross-lagged panels of subgroups. Since the traditional content categories subsume variation in format, characters, violence and cognitive level, they were examined for effects independent of viewing amount.

## Method

The study was conducted in two time periods during the school year, 18 months apart. During time 1, 145 students in six 1st, 3rd, and 5th grade classes of a suburban Long Island public school were asked to participate. The following circumstances reduced the final sample size: a) 21 failed to complete diaries in time 1, b) 13 left the school district before time 2, c) 11 were not from middle-class homes, as indicated by paternal or maternal occupation.

Time 1 viewing was measured by the diary method. During time 2, the aided recall method was used. In time 1, 5 x 7 cards were distributed in the classroom. Each subject received two cards charted according to the seven weekdays. Subjects were asked to list free time activities on one card and television programs on the other. Older subjects were asked to complete their cards on a daily basis. Parents of the youngest group were asked by mail to provide the information. All subjects received a reward (candy bar) when the data was returned one week later.

Due to high subject loss with the diary method, aided recall was used in time 2. In an individual interview with one of two advanced undergraduate female interviewers, subjects were asked to detail their previous day's leisure activities. Then they were shown the previous day's television schedule and asked to indicate times and programs viewed. In each case, the interview concerned a school day.

Total viewing amount and category scores were estimated by assuming programs were viewed through the time period indicated in the newspaper guide. For each time period two raters independently combined programs into two content categories: cartoons, adventure, crime, game, sports, news and public affairs, children's educational, drama, comedy, and musical variety. When agreements were divided by total ratings for each category, reliability exceeded 85 percent for any single category. Final disagreements were resolved by discussion.

Grades. Academic grades and effort grades were obtained from report cards issued two weeks after viewing measures were obtained. For the youngest age, teachers used a five point scale from U to O. Older subjects received traditional A to F grades. Since from 5 to 9 grades were issued in any given time period, a mean academic grade was calculated. Effort grades were defined on the report card as the degree to which the academic grades represented the student's ability.

## Results

When estimates of viewing amount were compared, there were few group differences. Since the time 2 measure required recognition rather than recall, it elicited greater time estimates in a two-way analysis of variance (age x time), $F$ (1,87) = 7.26, $p < .01$. When daily estimates in time 2 were multiplied by 7, average weekly viewing was 17.4 hours, compared to weekly time 1 estimates of 14.0 hours. As indicated in previous studies (Lyle & Hoffman, 1972) content preferences differed significantly between age sub-groups. Sex and achievement level were not associated with significantly different viewing habits for the majority of the rated categories. Table 1 illustrates the main effects of 3-way analyses of variance for each category and for school grades. Older subjects tended to view fewer cartoons, adventure shows, and children's educational programs and more sports, crime, comedy, games, romance and musicals. Subjects in the early grades also received lower grades; the discrepant lettering system seems responsible for this finding, as teachers tended to give large numbers of Satisfactory grades and fewer Outstanding grades. As expected, subjects above the median in CAT scores received higher academic grades during both time periods; they also obtained higher effort grades in time one.

The main question of whether viewing amount affects school grades was first examined for the entire group. Multiple correlation coefficients calculated for both viewing amount and grades (average grade and effort grade) indicated a significant overall relationship: TV1G1 $r$ (3,87) = -.27; TV1G2 $r$ (3,87) = -.30; TV2G2 $r$ (3,87) = -.23. Tests of individual panels only indicated a significant relationship for effort grades. Figure 1 illustrates the results for the TV-Effort panel. The synchronous correlations, (TV1E1 and TV2E2) are both in the negative direction.

The cross-lagged correlations are TV1E2 and E1TV2; for the latter correlations at least two criteria must be met to demonstrate causation. First, at least one correlation must be significant. Second, the higher correlation must significantly exceed the lower. The time sequence of the higher correlation identifies causal direction. As indicated in the figure, the higher correlation is between time 1 viewing and time 2 effort grades. The difference between the two correlations, as calculated by a comparison recommended by Kenny (1975) is significant ($z = -2.00$, $p < .05$).

After the overall comparisons, subjects were divided into groups according to sex, age, and achievement scores. When male and female TV-Effort panels were compared, both groups yielded similar causal patterns. On the other hand, comparison of 3 age and 2 achievement panels each, for grade average and effort grades indicated that in two subgroups subjects were strongly negatively affected by viewing amount. Table 2 illustrates the results. Both effort grades and academic grades of the youngest age group and effort grades of lower achievers were significantly vulnerable to the effects of increased viewing. Separate cross-lagged comparisons for 8-yr.-olds and 10-yr.-olds and lower achievers were not significant. Thus the stronger effects found in two subgroups accounted for the small causal relationship seen in the group as a whole.

Partial cross-lagged correlations were obtained for all subjects and for age and achievement subgroups in order to determine whether specific content categories affected grades and/or effort. Total viewing was partialed from specific categories. If the correlation remained significant ($p < .05$) the difference between cross-lagged correlations was calculated in order to determine whether content viewing affected subsequent academic and/or effort grades.

Effort grades were not differentially affected by 9 of the 10 content categories. Comparisons were made for all subjects, for 6-7 yr.-olds, higher achievers, and lower achievers. The only significant cross-lagged differences were obtained for news and public affairs viewing. Time 1 public affairs viewing significantly increased time 2 grades for all subjects: $\underline{D} = .33$, $z = 2.25$, $\underline{p} < .05$ and for higher achievers: $\underline{D} = .39$. Since news viewing accounted for less than one percent of time one viewing, it appears that increased viewing amount irrespective of type of program viewed negatively affected teachers' perceptions of student effort.

Academic grades were not affected by content categories for the group as a whole. While some of the TV1G2 correlations were significant, cross-lagged comparisons supported third variable interpretations since the differences were not significant. Further examination of subgroups indicates that content did differentially affect the grades of low achievers and first-graders. The youngest group yielded significant causal differences in four categories. Cartoons ($\underline{D} = .353$) and children's educational programs ($\underline{D} = .853$) had positive effects. Adventure shows ($\underline{D} = -.397$) and comedies ($\underline{D} = .684$) had negative effects. Low achievers' grades were positively affected by increased cartoon viewing ($\underline{D} = .372$) and viewing more children's educational programs ($\underline{D} = .440$). High achiever's academic grades were increased by public affairs viewing in time 1 ($\underline{D} = .390$.

## Discussion

The pattern of correlations in the significant cross-lagged panels rules out third variable explanations offered in the past in terms of parental socialization practices and personality differences. For instance, parent-child conflict during

a given time period might simultaneously lower grades and raise viewing levels (Bailyn, 1959). If the explanation were true, both cross-lagged correlations would be equally high or low, depending on how long the parental variable was influential. Similar values would be obtained if persistent behavioral tendencies or social conditions increased viewing and decreased grades. For instance, in the present study the academic grades-effort grades panel indicated consistent high positive synchronous and cross-lagged correlations. However, the difference between cross-lags was low, indicating the extent to which both grades are correlated is due to other conditions.

In the past, several authors have speculated regarding the manner in which cognitive level mediates the effects of television viewing (Schramm, Lyle & Parker, 1961). Convergent results from subgroups functioning on a lower intellectual level provide support for the notion of experience potency in early developmental stages. Perhaps brighter and/or older students have already developed active approaches to learning or critical skills, which immunize them to the adverse effects of programs and/or of the viewing process.

Although no specific content dimension was predicted to affect grades, past studies (Friedrich & Stein, 1973) have found that task-related activities in a nursery school setting were positively affected by viewing a pro-social (educational) program and negatively affected by a crime program. In the present study, educational shows and news viewing related positively to grades. The negative effects of comedies and positive effects of cartoons are less easily explained by previously obtained results or current observational learning theories.

In summary, the findings suggest that home television viewing affects the school performance of socioeconomically

advantaged children in the following ways.

a) Academic performance depended on the content of programs viewed.

b) Effort grades depended on total viewing amount.

c) Effects interacted with grade level and relative achievement level; higher achievers and older students did not appear as susceptible to amount and content.

If home viewing can be manipulated in field experiments, controlled studies can focus more directly on the complex relationship between television viewing, program content, the home environment, academic methods and expectations, and individual differences of students.

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Table 1

Sub-group Differences:

Content Viewing and Grades

| | Age[a] | | Sex[b] | | Achievement[c] | |
|---|---|---|---|---|---|---|
| | T1 | T2 | T1 | T2 | T1 | T2 |
| Cartoons | -* | -** | 0 | 0 | 0 | 0 |
| Adventure | 0 | -* | 0 | 0 | 0 | 0 |
| Sports | +** | 0 | +** | 0 | 0 | 0 |
| Crime | +** | 0 | 0 | +* | 0 | 0 |
| Comedy | 0 | +* | 0 | 0 | -* | 0 |
| Game | +** | 0 | 0 | 0 | 0 | 0 |
| News | 0 | 0 | 0 | 0 | 0 | 0 |
| Educational | -** | -* | 0 | 0 | 0 | 0 |
| Romance | ( | +* | 0 | -* | 0 | 0 |
| Musical | +** | 0 | -** | 0 | 0 | 0 |
| Acad. Grades | +** | 0 | 0 | 0 | +** | +** |
| Effort Grades | +** | +** | 0 | 0 | +** | 0 |

a. +: older Ss higher; -: younger Ss higher; 0: no difference

b. +: males higher; -: females higher; 0: no difference

c. +: higher achievers higher; -: higher achievers lower;
0: no difference

* $p < .05$

** $p < .01$

Table 2

Subgroup Panels

Television and Effort

| r | Age | | | Achievement | | Sex | |
|---|---|---|---|---|---|---|---|
| | 6-7 | 8-9 | 10-11 | <75.5% | >75.5% | M | F |
| 1. TV1E1 | - .52** | .25 | - 33* | - .37* | - .00 | - .15 | - .34* |
| 2. TV2E2 | - .25 | - .19 | .41* | - .17 | - .22 | - .37* | - .10 |
| 3. TV1E2 | - .54** | .07 | - .29 | - .33** | - .17 | - .26 | - .34* |
| 4. TV2E1 | - .06 | .07 | .03 | .13 | - .00 | .12 | - .05 |
| z (3-4) | -2.29* | <1.00 | -1.43 | -2.30* | <1.00 | -1.89* | -1.45 |

Table 3

Subgroup Panels

Television and Grades

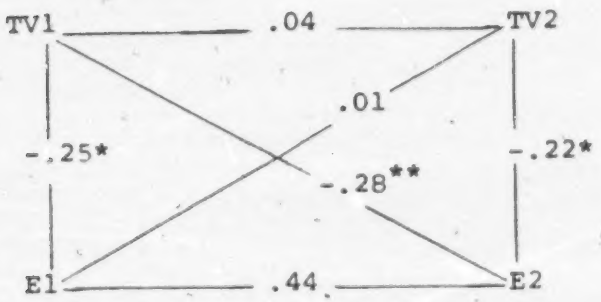
| r | Age | | | Achievement | | Sex | |
|---|---|---|---|---|---|---|---|
| | 6-7 | 8-9 | 10-11 | <75.5% | >75.5% | M | F |
| 1. TV1G1 | - .54** | .07 | - .20 | - .19 | - .13 | .07 | - .34* |
| 2. TV2G2 | - .03 | - .15 | - .20 | .04 | - .10 | - .19 | - .07 |
| 3. TV1G2 | - .42* | - .03 | - .30* | - .32* | .07 | - .12 | - .30* |
| 4. TV2 G1 | .06 | - .14 | - .30* | .09 | - .10 | - .19 | - .04 |
| z (3-4) | -2.27* | <1.00 | <1.00 | -1.05 | <1.00 | <1.00 | <-1.32 |

* $p < .05$

** $p < .01$

Figure 1

Viewing Amount and Grades:
TV-Effort Panel




* $p < .05$

** $p < .01$